



**MUNICIPAL SOLID WASTE LANDFILL
GAS COLLECTION AND CONTROL SYSTEM (GCCS)
STARTUP, SHUTDOWN, AND MALFUNCTION PLAN
COTTONWOOD HILLS RECYCLING AND DISPOSAL FACILITY
MARISSA, ILLINOIS**

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Date of Issuance:
February 2008

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**MUNICIPAL SOLID WASTE LANDFILL
GAS COLLECTION AND CONTROL SYSTEM (GCCS)**

STARTUP, SHUTDOWN, AND MALFUNCTION PLAN

**COTTONWOOD HILLS RECYCLING AND DISPOSAL FACILITY
MARISSA, ILLINOIS**

This startup, shutdown, and malfunction (SSM) plan (SSM Plan) was prepared by Waste Management of Illinois, Inc. in order to comply with the requirements of 40 CFR 63.6(e)(3), as this facility is subject to 40 CFR Part 63, Subpart AAAA, the National Emission Standard for Hazardous Air Pollutants (NESHAPs) for Municipal Solid Waste (MSW) landfills. The SSM Plan contains all of the required elements set forth within 40 CFR 63.6(e).

This SSM Plan will be revised if the procedures described herein do not adequately address any malfunction or startup/shutdown events that occur at the facility. A copy of the original plan and all revisions/addenda will be kept on file at the facility for at least five (5) years. The Facility Manager is responsible for assuring that the most recent copy of this SSM Plan is made available to all personnel involved with the landfill gas (LFG) collection and control system (GCCS) at the facility as well as to appropriate regulatory agency personnel for inspection.

Approved:

Facility Manager:

Joe Durako
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2/5/08
Date

Approved:

Facility Engineer:

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2/5/08
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Appendices

- A Common Causes and Response Actions for GCCS Malfunctions
- B SSM Reporting Forms
- C Site Specific Information

1 Revision History

Add the effective date of the most-recent revision to the list below. Do not overwrite or delete any dates. This is intended to be a complete record of all revisions made to this plan, and assists in making certain that all plan versions are retained for at least 5 years as required by §63.6(e)(3)(v).

Date of Initial Issuance
February 2008
Revision Dates

2 Introduction

2.1 Purpose and Scope

The municipal solid waste (MSW) landfill owner or operator of an affected source must develop and implement a written startup, shutdown, and malfunction (SSM) Plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction; a program of corrective action for malfunctioning processes; and air pollution control and monitoring equipment used to comply with the relevant standard. The purpose of the SSM Plan is to:

- Ensure that, at all times, the MSW landfill owner or operator operates and maintains the affected source, including associated air pollution control and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions to the levels required by the relevant standards;
- Ensure that MSW landfill owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and
- Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

Cottonwood Hills Recycling and Disposal Facility (RDF) is an existing affected source under the Maximum Achievable Control Technology (MACT) rule for MSW landfills. It commenced construction of the landfill in March 2000 (before the statutory date of November 7, 2000) making it an existing affected source. The first NMOC Rate report greater than 50 mg/yr was submitted on June 1, 2007. Although a gas collection and control system is not required for 30 months (December 1, 2009), the gas collection and control system began operating in February 2008 at the facility to control odor. As such, a SSM Plan is required to be prepared and implemented for this landfill and this SSM Plan meets or exceeds this requirement.

The management of the facility fully understands and acknowledges the SSM Plan requirements of the MACT rule. This SSM Plan has been developed to specifically address these requirements as summarized above.

2.2 Description of SSM Plan

This SSM Plan has been divided into three major sections comprising the major elements related to startup, shutdown, and/or malfunction of a landfill gas (LFG) collection and control system (GCCS) at a MSW landfill. Malfunction events are distinct events when the GCCS is not operating in accordance with NSPS/EG requirements and which result, or have the potential to result, in an exceedance of one or more emission limitations or operational standards under the NSPS/EG. Startup and shutdown events are generally planned events associated with system

repair, maintenance, testing, and upgrade, and may or may not be related to or occur in association with a malfunction of the GCCS.

2.3 Site Equipment Subject To This SSM Plan

The following components of the GCCS are subject to this SSM Plan:

Collection wells and other collectors
Lateral and header extraction piping
LFG mover equipment
Open Flare
Flow monitoring and recording equipment
Communication Equipment

3 Startup Plan

This section details procedures for the startup of the GCCS to ensure that, at all times, good safety and air pollution control practices are used for minimizing emissions to the levels required by the relevant standards.

Pursuant to the requirements of the NSPS/EG for MSW landfills, a GCCS must be installed and operated when the landfill exceeds a threshold of 50 Mg/year NMOC and meets all the applicable criteria for a controlled landfill.

3.1 How to Identify a GCCS Startup Event

The regulatory definition of “startup” reads as follows:

“Startup means the setting in operation of an affected source or portion of an affected source for any purpose.” (§63.2)

GCCS startup operations generally include startup of gas mover equipment, LFG control devices, and any ancillary equipment that could affect the operation of the GCCS (e.g., power supply, air compressors, etc.).

3.2 What to do When the GCCS is Started-Up

The following provides a summary of typical response actions for startup of the GCCS.

3.2.1 Gas Mover and Collection System

The following activities may have the potential to emit regulated air pollutants to the atmosphere during startup of the collection system portion of GCCS: (1) purging of gases trapped within piping system prior to normal operation; (2) repair of system leaks discovered during startup, and (3) all other activities after construction of the system but prior to fulltime operation, which could release HAPs from the collection system. These activities would be subject to the SSM Plan portion of the SSM Plan.

During such activities, work shall progress such that air emissions are minimized to the greatest extent possible by:

- Temporarily capping pipes venting gas if such capping does not impact safety or the effective construction of the system.
- Minimizing surface area allowing gas to emit to the atmosphere to the extent that it does not impact safety or the effective construction of the system.

- Ensuring that other parts of the system, not impacted by the activity, are operating in accordance with the applicable requirements of NSPS/EG.
- Limiting the purging of piping (1 hour or less) to as short duration as possible to ensure safe combustion of the gas in the control device.

GCCSs, once installed, are “closed” systems designed to prevent the uncontrolled release of LFG to the atmosphere. The network of piping installed at the site connects each extraction point with the control device(s) with no open vents located anywhere in the collection system.

Portions of collection systems or individual extraction points may be isolated by valves installed in the system from time to time and subsequently opened. Opening these valves shall not be considered a startup, unless such an activity causes the venting of gas to the atmosphere. If the activity results in emissions to the atmosphere, the actions listed in the Standard Operating Procedure shall be followed.

The operation of the collection system, once installed, shall be consistent with the provisions of NSPS/EG as well as the GCCS Design Plan, which has been developed and approved for the facility.

3.2.2 Control Device(s):

Personnel shall follow the procedures as identified below when starting the respective control devices. Control devices operating at MSW landfills normally undergo planned startups. However, flare systems are designed for unattended operation. There are instances when the flare system will shutdown and automatically restart. The shutdown may occur when there is a brief interruption of gas flow to the flare. These shutdown events are followed by an automatic startup sequence as described in the standard operating procedures incorporated as part of this SSM Plan, as listed below.

The flare temperature and/or flow recorders will document significant decreases in temperature and/or flow measurements followed by an almost immediate increase back to normal ranges whenever the automatic shutdown/startup sequence occurs. Documentation of the date, time and duration of these automatic shutdown/startup events is contained in the flare temperature and/or flow recorder data. In addition, there are no actions that need to be taken to affect the shutdown/startup sequence in these instances; therefore, these activities do not need to be documented beyond the information already contained on the recorders. Documentation of automatic shutdown/startup events will be included in the semi-annual reports.

Standard Operating Procedures

Startup

- 1 Check that there are no unsafe conditions present.
- 2 Check that the system is ready to start by one or more of the following:

- a. Valves are in correct operating position
 - b. Levels, pressures, temperatures are within normal starting range
 - c. Alarms are cleared
 - d. Power is on and available to control panel and energized equipment
 - e. Emergency Stop is de-energized
 - f. Check that there are no gas emissions
 - g. Check that all wellheads are intact
 - h. Check that there are no signs of pipe damage
- 3 Initiate start sequence (Note time and date on top section of form as Start)
 - 4 Observe that system achieves normal operating ranges for levels, pressures, and temperatures (Note time and date on top section of form as End)
 - 5 Complete top section of form. Duration is the time it takes to go from Step 3 to 4.

3.3 What to Record for All Startup Events

The operator shall record the following information on the attached **Startup/Shutdown/Malfunction Report Form** (Appendix B):

- The date and time the startup occurred.
- The duration of the startup.
- The event code on the back of the form describing the reason for startup.
- Whether procedures in this SSM Plan were followed. If the procedures in the SSM Plan were not followed, a **SSM Plan Departure Report Form** (Appendix B) must also be completed.

3.4 Whom to Notify at the Facility in Case of a Startup Event

- The Facility Manager and/or Facility Engineer should be notified of Start-up events if one or more of the following occurs:
 - The duration of start-up takes longer than one hour for control devices;
 - The duration of start-up takes longer than five days for the collection system;
 - Uncombusted landfill gas is emitted during the start-up;
 - The start-up procedures listed in this SSM plan are not followed; or
 - A malfunction occurs during start-up.
- The **Startup/Shutdown/Malfunction Report Form** should be initially prepared upon startup and implementation of the SSM Plan. The form should be finalized by the operator on duty upon successful implementation of the SSM Plan and

submitted to the Facility Engineer on a routine basis. The original form should be retained in the landfill files for five (5) years. As previously noted, documentation of the date, time and duration of automatic shutdown/startup events is contained in the flare temperature and/or flow charts. In addition, there are no actions that need to be taken to affect the shutdown/startup sequence in these instances; therefore, these activities do not need to be documented beyond the information already contained on chart/data recorders.

3.5 What to Report for a Startup Event

- If the actions taken during the startup **were consistent** with this SSM Plan, file the necessary information in your semi-annual SSM report with the following information included:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the owner/operator or other responsible official;
 3. Statement that the actions taken during the startup or shutdown were consistent with the SSM Plan; and
- If the actions taken during the startup **were not consistent** with this SSM Plan, file the necessary information in your semi-annual SSM report (*within 30 days following the end of each 6-month period*) with the following information included:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the owner/operator or other responsible official;
 3. Statement that the actions taken during the startup or shutdown were not consistent with the SSM Plan, but that no applicable emission limitations were exceeded.
- If the actions taken during a startup **were not consistent** with this SSM Plan, and the startup resulted in an exceedance of an applicable emission standard, the Facility Manager must report the actions taken to the enforcing authority by telephone or facsimile transmission within two (2) working days after the startup or shutdown. A letter must then be sent to the enforcing authority within seven (7) working days after the startup or shutdown. The letter should be sent by certified or registered mail or overnight delivery service, and must include the following information:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the responsible official;
 3. A copy of the **Startup/Shutdown/Malfunction Report Form**;
 4. Detailed explanation of the circumstances of the startup;
 5. The reasons the SSM Plan was not adequate; and whether any excess emissions and/or parameter monitoring exceedances is believed to have occurred during the event.
 6. A copy of the **SSM Plan Departure Report Form**.

3.6 Plan Revisions

If the actions taken during the startup **were not consistent** with this SSM Plan, the Facility Engineer at the landfill must:

1. Revise the SSM Plan within 45 days after the malfunction to include procedures for operating and maintaining the GCCS during similar malfunction events.
2. Include the revised SSM Plan in the semi-annual report (within 60 days following the end of each 6-month period).

If the revisions to the SSM Plan alter the scope of the process activities at the facility or otherwise modify the applicability of any emission limit, work practice requirement, or other requirement in the MACT rule and/or the NSPS/EG, the revised SSM Plan is not effective until written notice has been provided to the permitting authority describing the SSM Plan revision(s).

4 Shutdown Plan

This section details procedures for the shutdown of the GCCS to ensure that, at all times, good safety and air pollution control practices are used for minimizing emissions to the levels required by the relevant standards.

Pursuant to the requirements of the NSPS for MSW landfills, a GCCS can not be removed unless the landfill meets all the applicable criteria for removal of collection and control system in 40 CFR 60, Subpart WWW.

4.1 How to Identify a GCCS Shutdown Event

The regulatory definition of “shutdown” reads as follows:

“Shutdown means the cessation of an affected source or portion of an affected source or portion of an affected source for any purpose.” (§63.2)

With GCCS, shutdown events would generally include shutdown of gas mover equipment, LFG control devices, as well as any ancillary equipment that could affect the operation of the GCCS (e.g., power supply, air compressors, etc.)”

The following list includes events that may necessitate a shutdown of the GCCS at a MSW Landfill. This list should not be considered exhaustive.

Table 4-1—Potential Events Necessitating Shutdown of the GCCS

Control Device Maintenance, Repair, or Cleaning
Addition of New GCCS Components
Extraction Well Raising
Movement of LFG Piping to Accommodate New Components or Filling Operations
Source Testing
Gas Mover Equipment Maintenance, Repair, or Cleaning
Gas Processing Equipment Maintenance, Repair, or Cleaning
Ancillary Equipment (e.g., compressors, etc.) Maintenance, Repair, or Cleaning
New Equipment Testing and Debugging
Shutdown and Subsequent Startup to Address Malfunctions or Other Occurrences
Planned Electrical Outages

4.2 What To Do When The GCCS Is Shutdown

4.2.1 Collection System

GCCSs, once installed, are “closed” systems designed to prevent the uncontrolled release of LFG to the atmosphere. The network of piping installed at the site connects each extraction point with the control device(s) with no open vents located anywhere in the collection system.

Portions of collection systems or individual extraction points may be isolated by valves installed in the system from time to time. Closing these valves shall not be considered a shutdown, unless such an activity causes an exceedance of the provisions of NSPS/EG and/or any subsequent approvals of alternatives in the facility’s GCCS Design Plan or approved variances issued thereafter. If a shutdown occurs, refer to the Standard Operating Procedures for Shutdown in the next subsection.

4.2.2 Control Device(s):

Personnel shall follow the procedures as identified below when shutting down the respective control devices. Control devices operating at MSW landfills normally undergo planned shutdown for the various events listed above. Shutdowns for equipment malfunction or breakdown should be addressed in the malfunction plan. Additional guidance for control device shutdown procedures can be located in operations manuals, notes, reports, etc.

Standard Operating Procedures

Shutdown

- 1 Check that there are no unsafe conditions present
- 2 Initiate shutdown sequence by one or more of the following (Note time and date on top section of form as Start)
 - a. Press Emergency Stop if necessary
 - b. Close On/ Off switch(es) or Push On/ Off button(s)
 - c. Close adjacent valves if necessary
- 3 Observe that system achieves normal shutdown ranges for levels, pressures, and temperatures (Note time and date on top section of form as End)
- 4 Complete top section of form. Duration is the time it takes to go from Step 2 to 3.

4.3 What To Record For All Shutdown Events

The operator should record the following information on the attached **Startup/Shutdown/Malfunction Report Form** (Appendix B):

- The date and time the shutdown occurred.
- The duration of the shutdown.
- The event code on the back of the form describing the reason for shutdown.
- Whether procedures in this SSM Plan were followed. If the procedures in the plan were not followed, a **SSM Plan Departure Report Form** must also be completed.

4.4 Whom to Notify at the Facility in Case of a Shutdown Event

- The District Manager and/or Facility Engineer should be notified of shutdown events if one or more of the following occurs:
 - The duration of shutdown takes longer than one hour for control devices;
 - The duration of shutdown takes longer than five days for the collection system;
 - Uncombusted landfill gas is emitted during the shutdown;
 - The shutdown procedures listed in this SSM plan are not followed; or
 - A malfunction occurs during shutdown.
- The **Startup/Shutdown/Malfunction Report Form** should be initially prepared upon shutdown and implementation of the SSM Plan. The form should be finalized by the operator on duty upon successful implementation of the SSM Plan and submitted to the Facility Engineer on a routine basis. The original form should be retained in the landfill files for five (5) years. As previously noted, documentation of the date, time and duration of automatic shutdown/startup events is contained in the flare temperature and/or flow charts. In addition, there are no actions that need to be taken to affect the shutdown/startup sequence in these instances; therefore, these activities do not need to be documented beyond the information already contained on chart/data recorders.

4.5 What to Report for a Shutdown Event

- If the actions taken during the shutdown **were consistent** with this SSM Plan, file the necessary information in your semi-annual SSM report with the following information included:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the responsible official;

3. Statement that the actions taken during the shutdown were consistent with the SSM Plan; and
- If the actions taken during the shutdown **were not consistent** with this SSM Plan, file the necessary information in your semi-annual SSM report (*within 30 days following the end of each 6-month period*) with the following information included:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the owner/operator or other responsible official;
 3. Statement that the actions taken during the startup or shutdown were not consistent with the SSM Plan, but that no applicable emission limitations were exceeded.
 - If the actions taken during a startup **were not consistent** with this SSM Plan, and the shutdown resulted in an exceedance of an applicable emission standard, the Facility Manager must report the actions taken to the enforcing authority by telephone or facsimile transmission within two (2) working days after commencing the actions that were inconsistent with the plan. A letter must then be sent to the enforcing authority within seven (7) working days after the startup or shutdown. The letter should be sent by certified or registered mail or overnight delivery service, and must include the following information:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the responsible official;
 3. A copy of the **Startup/Shutdown/Malfunction Report Form**;
 4. Detailed explanation of the circumstances of the shutdown;
 5. The reasons the SSM Plan was not adequate;
 6. Whether any excess emissions and/or parameter monitoring exceedances are believed to have occurred during the event; and
 7. A copy of the **SSM Plan Departure Report Form**.

4.6 Plan Revisions

If the actions taken during the shutdown **were not consistent** with this SSM Plan, the Facility Engineer at the landfill must:

1. Revise the SSM Plan within 45 days after the malfunction to include procedures for operating and maintaining the GCCS during similar malfunction events.
2. Include the revised SSM Plan in the semi-annual report (within 60 days following the end of each 6-month period).

If the revisions to the SSM Plan alter the scope of the process activities at the facility or otherwise modify the applicability of any emission limit, work practice requirement, or other requirement in the MACT rule and/or the NSPS/EG, the revised SSM Plan is not effective until written notice has been provided to the permitting authority describing the SSM Plan revision(s).

5 Malfunction Plan

5.1 How to Identify a GCCS Malfunction

The regulatory definition of “malfunction” reads as follows:

“Malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.” (§63.2, revised 5/30/03)

The following list includes events that may constitute a malfunction of the GCCS at the facility. The cause of these events should be investigated immediately in order to determine the best course of action to correct the malfunction. Each of these malfunctions could have multiple causes that need to be evaluated and possibly considered. It is the intent of this SSM Plan to provide most of the causes for the specific malfunction events in order to better evaluate the treatment options for the malfunction. The listed causes are to be considered a guide only and are not exhaustive. Common malfunction events for LFG collection and control systems are listed in Table 5-1.

Table 5-1—Potential Malfunction Events

Possible Malfunction	Section
Loss of LFG Flow/Gas Mover Malfunction	5.3
Loss of Electrical Power	5.4
Low Temperature Conditions at Control Device	5.5
Loss of Flame at the Control Device	5.6
Malfunction of Flow Measuring/Recording Device	5.7
Malfunction of Temperature Measuring/Recording Device	5.8
Collection Well and Pipe Failures	5.9
Other Control Device Malfunctions	5.10
Malfunctions of Control Device Monitoring Equipment	5.11

For one of these occurrences to be considered a malfunction that is required to be addressed by this SSM Plan, it must result in, or have the potential to result in, an exceedance of one or more of the NSPS/EG operational and compliance requirements or the provisions of the MACT rule (e.g., exceedance, reading outside of required operational range, etc). The following list constitutes the possible exceedances of the New Source Performance Standards (NSPS) for

MSW landfills and/or the state/local emission guidelines (EG) rule that could occur due to a malfunction of GCCS, thereby necessitating implementation of this SSM Plan:

**Table 5-2— Potential Emission Limitation Exceedances
Caused by Malfunction Events**

GCCS downtime of greater than 5 days (if alternative timeframe has not been established)
Free venting of collected LFG without control for greater than one hour
Downtime for temperature monitoring and/or recording equipment of greater than 15 minutes (if alternative timeframe has not been established)
Any downtime for LFG flow monitoring and/or recording equipment (if alternative timeframe has not been established)

If the occurrence does not result in an exceedance of an applicable emission limitation, or does not have the potential to result in such an exceedance, then it is not required to be corrected in accordance with this SSM Plan, although use of the plan may still be advisable. Malfunctions should be considered actionable under this SSM Plan whether they are discovered by the MSW landfill owner or operator during normal operations or by a regulatory agency during compliance inspections.

The operator should follow all the corrective action, notification, record keeping, and reporting procedures described herein in case of malfunction of the GCCS.

5.2 What To Do When The GCCS Malfunctions—All Malfunctions

- The Facility Manager and/or Facility Engineer should be notified immediately of malfunction events if one or more of the following occurs:
 - The duration of the malfunction takes longer than one hour for control devices;
 - The duration of the malfunction takes longer than five days for the collection system;
 - Uncombusted landfill gas is emitted during the malfunction;
 - The flow recording and/or temperature recording devices experience down time for more than 15 minutes;
 - The malfunction procedures listed in this SSM plan are not followed.
- If malfunction is causing release of uncombusted landfill gas, take necessary steps to reduce emissions to the maximum extent possible using good air pollution control practices and safety procedures.
- Proceed with the malfunction diagnosis and correction procedures described in the **Startup/Shutdown/Malfunction Report Form** provided in Appendix B. Appendix A (“Common Causes and Response Actions for GCCS Malfunctions”) and Sections 5.6 – 5.14 contain general guidelines for several types of malfunctions.

- If the procedures in this SSM Plan do not address or adequately address the malfunction that has occurred, the operator should attempt to correct the malfunction with the best resources available, and note the circumstances and actual steps taken to correct the malfunction. The Facility Manager and/or Facility Engineer for the site should be notified of this situation immediately. Complete a **SSM Plan Departure Report Form** (Appendix B) as discussed in Section 5.3. The SSM Plan must be updated to better address this type of malfunction.
- Once the malfunction is corrected, complete the **Startup/Shutdown/Malfunction Report Form** (Appendix B).

5.2.1 Potential Malfunctions/Corrective Actions

The following subsections list typical malfunctions that can occur within the wellfield, and potential corrective actions. Additional guidance is provided in Appendix A.

5.2.1.1 Loss of LFG Flow/Gas Mover Malfunction

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Check to see if the control device has shutdown. If control device has shutdown, make sure that gas mover equipment has shutdown to prevent free venting of LFG. Attempt to restart control device to determine if system will remain operational.
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction cannot be corrected within 5 days, notify the Facility Manager and/or Facility Engineer and follow the procedures to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting.

5.2.1.2 Loss of Electrical Power

- Follow also the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction cannot be corrected within the time frame allowed by the NSPS/EG rule, notify the Facility Manager and/or Facility Engineer.

5.2.1.3 Low Temperature Conditions at the Control Device

- Follow also the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Check to see if the control device has shutdown. If control device has shutdown, make sure that gas mover equipment has shutdown to prevent free venting of LFG. Attempt to restart control device to determine if system will remain operational.
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction causes the GCCS to go off-line and cannot be corrected within the time frame allowed by the NSPS/EG rule, notify the Facility Manager and/or Facility Engineer.

5.2.1.4 Loss of Flame at the Control Device

- Follow also the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Check to see if the control device has shutdown. If control device has shutdown, make sure that gas mover equipment has shutdown to prevent free venting of LFG. Attempt to restart control device to determine if system will remain operational.
- If system will not restart, follow also the procedures in Section 5.3, above: **Loss of LFG Flow.**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction cannot be corrected within the time frame allowed by the NSPS/EG rule, notify the Facility Manager and/or Facility Engineer.

5.2.1.5 Malfunctions of Flow Monitoring/Recording Device

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction cannot be corrected in the time frame allowed by the NSPS/EG rule, notify the Facility Manager and/or Facility Engineer.

5.2.1.6 Malfunctions of Temperature Monitoring/Recording Device

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction cannot be corrected within 15 minutes, notify the Facility Manager and/or Facility Engineer.

5.2.1.7 Collection Well and Pipe Failures

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Follow also the procedures in Section 5.3, above: **Loss of Flow/Gas Mover Malfunction.**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction causes the entire GCCS to go off-line and cannot be corrected within 5 days, notify the Facility Manager and/or Facility Engineer and follow the procedures to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting.

5.2.1.8 Other Control Device Malfunctions

- Follow also the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions.**
- Check to see if the control device has shutdown. If control device has shutdown, make sure that gas mover equipment has shutdown to prevent free venting of LFG. Attempt to restart control device to determine if system will remain operational.
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix A.
- If the malfunction causes the entire GCCS to go off-line and cannot be corrected within 5 days, notify the Facility Manager and/or Facility Engineer and follow the procedures to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting.

5.3 What to Record for a Malfunction

The operator must record the following information on the attached **Startup/Shutdown/Malfunction Report Form**:

- The date and time the malfunction occurred.
- The duration of the malfunction.
- A description of the affected equipment (by using the appropriate event code).
- The cause or reason for the malfunction (by using the appropriate event code).
- The actions taken to correct the malfunction (checklist).
- Whether the procedures in this SSM Plan were followed. If the procedures in the plan were not followed, a **SSM Plan Departure Report Form** (see Appendix B) must also be completed.

5.4 Whom to Notify at the Facility in Case of a Malfunction

- The Facility Manager and/or Facility Engineer should be notified immediately of malfunction events if one or more of the following occurs:
 - The duration of the malfunction takes longer than one hour for control devices;
 - The duration of the malfunction takes longer than five days for the collection system;
 - Uncombusted landfill gas is emitted during the malfunction;
 - The flow recording and/or temperature recording devices experience down time for more than 15 minutes;
 - The malfunction procedures listed in this SSM plan are not followed.
- The **Startup/Shutdown/Malfunction Report Form** shall be initially prepared upon discovery of the malfunction and implementation of the SSM Plan. The form shall be finalized by the operator on duty upon successful implementation of the SSM Plan and submitted to the Facility Engineer on a routine basis. The original form must be retained in the landfill files for five (5) years.

5.5 What to Report for a Malfunction Event

- If actions taken during the malfunction **were consistent** with the Plan, file the necessary information in your semi-annual SSM report with the following information included:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the responsible official;

3. Statement that the actions taken during the malfunction were consistent with the SSM Plan; and
 4. A copy of the **Startup/Shutdown/Malfunction Report Form**.
- If the actions taken during the malfunction **were not consistent** with this SSM Plan, but the malfunction did not result in the exceedance of an applicable emissions standard, file the following information in your semi-annual SSM report (*within 30 days following the end of each 6-month period*) with the following information included:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the Title V responsible official;
 3. Statement that the actions taken during the malfunction were not consistent with the SSM Plan, but that no applicable emission limitations were exceeded.
 - If the actions taken during a malfunction **were not consistent** with this SSM Plan, and the malfunction resulted in an exceedance of an applicable emission standard, (see items listed under Step 1 above), the Facility Manager must report the actions taken to the enforcing authority by telephone or fax within two (2) working days after commencing the actions that were inconsistent with the plan. A letter must then be sent to the enforcing authority within seven (7) working days after the malfunction. The letter should be sent by certified or registered mail or overnight delivery service, and must include the following information:
 1. Name and title of Facility Manager and/or Facility Engineer;
 2. Certifying signature of the responsible official;
 3. A copy of the **Startup/Shutdown/Malfunction Report Form**;
 4. Detailed explanation of the circumstances of the malfunction;
 5. The reasons the SSM Plan was not adequate; and
 6. Whether any excess emissions and/or parameter monitoring exceedances is believed to have occurred during the event.
 7. Prepare and include **SSM Plan Departure Report Form**.

5.6 Plan Revisions

If actions taken during malfunction **were not consistent** with the SSM Plan, the landfill must:

1. Revise the SSM Plan within 45 days after the malfunction to include procedures for operating and maintaining the GCCS during similar malfunction events.
2. Include the revised SSM Plan in the semi-annual report (within 60 days following the end of each 6-month period).

If revisions alter the scope of the process activities facility or otherwise modify any emission limit, work practice, or other requirement in the MACT rule and/or the NSPS/EG, the revised SSM Plan is not effective until written notice has been provided to the permitting authority.

APPENDIX A

Common Causes and Response Actions for GCCS Malfunctions

(Appendix A represents a summary of possible causes and response actions for GCCS malfunctions. The list is not considered to be exhaustive. The list of response actions is not intended to be a sequence of events that are to be implemented in order. Certain malfunction incidents may or may not be associated with the listed "common causes" nor will the "common response actions" be appropriate in all instances. Site-specific evaluation of the malfunctions and development of specific response actions is recommended in all cases.)

EQUIPMENT	PURPOSE	MALFUNCTION EVENT	COMMON CAUSES	TYPICAL RESPONSE ACTIONS
LFG Collection and Control System				
Blower or Other Gas Mover Equipment	Applies vacuum to wellfield to extract LFG and transport to control device	Loss of LFG Flow/Blower Malfunction	<ul style="list-style-type: none"> -Flame arrestor fouling/deterioration -Automatic valve problems -Blower failure (e.g., belt, motor, impeller, coupling, seizing, etc.) -Loss of power -Extraction piping failure -Condensate knock-out problems -Extraction piping blockages 	<ul style="list-style-type: none"> -Repair breakages in extraction piping -Clean flame arrestor -Repair blockages in extraction piping -Verify automatic valve operation, compressed air/nitrogen supply -Notify power utility, if appropriate -Provide/utilize auxiliary power source, if necessary -Repair Settlement in Collection Piping - Repair Blower -Activate back-up blower, if available -Clean knock-out pot/demister -Drain knock-out pot
Extraction Wells and Collection Piping	Conduits for extractions and movement of LFG flow	Collection well and pipe failures	<ul style="list-style-type: none"> -Break/crack in header or lateral piping -Leaks at wellheads, valves, flanges, Test ports, seals, couplings, etc. -Collection piping blockages -Problems due to settlement (e.g. pipe separation, deformation, development of low points) 	<ul style="list-style-type: none"> -Repair leaks or breaks in lines or wellheads -Follow procedures for loss of LFG flow/blower malfunction -Repair blockages in collection piping -Repair settlement in collection piping -Re-install, repair, or replace piping

EQUIPMENT	PURPOSE	MALFUNCTION EVENT	COMMON CAUSES	TYPICAL RESPONSE ACTIONS
LFG Collection and Control System				
Blower or Other Gas Mover Equipment And Control Device	Collection and control of LFG	Loss of electrical power	<ul style="list-style-type: none"> - Force majeure/Act of God (e.g., lightning, flood, earthquake, etc.) -Area-wide or local blackout or brown-out -Interruption in service (e.g. blown service fuse) -Electrical line failure -Breaker trip -Transformer failure -Motor starter failure/trip -Overdraw of power -Problems in electrical panel -Damage to electrical equipment from on-site operations 	<ul style="list-style-type: none"> -Check/reset breaker -Check/repair electrical panel components -Check/repair transformer -Check/repair motor starter -Check/repair electrical line -Test amperage to various equipment -Contact electricity supplier -Contact/contract electrician -Provide auxiliary power (if necessary)
LFG Control Device	Combusts LFG	Low temperature conditions at control device	<ul style="list-style-type: none"> -Problems with temperature - monitoring equipment -Problems/failure of -thermocouple and/or thermocouple wiring -Change of LFG flow -Change of LFG quality -Problems with air louvers -Problems with air/fuel controls -Change in atmospheric conditions 	<ul style="list-style-type: none"> -Check/repair temperature monitoring equipment -Check/repair thermocouple and/or wiring -Follow procedures for loss of flow/blower malfunction -Check/adjust louvers -Check/adjust air/fuel controls
LFG Control Device	Combusts LFG	Loss of Flame	<ul style="list-style-type: none"> -Problems/failure of thermocouple -Loss/change of LFG flow -Loss/change of LFG quality -Problems with air/fuel controls -Problems/failure of flame sensor -Problems with temperature monitoring equipment 	<ul style="list-style-type: none"> -Check/repair temperature monitoring equipment -Check/repair thermocouple -Follow procedures for loss of flow/blower malfunction -Check/adjust air/fuel controls -Check/adjust/repair flame sensor -Check/adjust LFG collectors
Flow Monitoring/Recording Device	Measures and records gas flow from collection system to control	Malfunctions of Flow Monitoring/Recording Device	<ul style="list-style-type: none"> -Problems with orifice plate, pitot tube, or other in-line flow measuring device -Problems with device controls and/or wiring -Problems with chart recorder 	<ul style="list-style-type: none"> -Check/adjust/repair flow measuring device and/or wiring -Check/repair chart/data recorder -Replace paper in chart recorder

EQUIPMENT	PURPOSE	MALFUNCTION EVENT	COMMON CAUSES	TYPICAL RESPONSE ACTIONS
LFG Collection and Control System				
Temperature Monitoring/Recording Device	Monitors and records combustion temperature of enclosed combustion device	Malfunctions of Temperature Monitoring/Recording Device	<ul style="list-style-type: none"> -Problems with thermocouple -Problems with device controls and/or wiring -Problems with chart recorder 	<ul style="list-style-type: none"> -Check/adjust/repair thermocouple -Check/adjust/repair controller and/or wiring -Check/adjust/repair electrical panel components -Check/repair chart recorder -Replace paper in chart recorder
Control Device	Combusts LFG	Other Control Device Malfunctions	<ul style="list-style-type: none"> -Control device smoking (i.e. visible emissions) -Problems with flare insulation -Problems with pilot light system -Problems with air louvers -Problems with air/fuel controllers -Problems with thermocouple -Problems with burners -Problems with flame arrester -Alarmed malfunction conditions not covered above -Unalarmed conditions discovered during inspection not covered above 	<ul style="list-style-type: none"> -Site-specific diagnosis procedures -Site-specific responses actions based on diagnosis -Open manual louvers -Clean pitot orifice -Clean/drain flame arrestor -Refill propane supply -Check/repair pilot sparking system



APPENDIX B
SSM Plan Reporting Forms

Startup / Shutdown / Malfunction Report Form

Site Name: Cottonwood Hills Recycling and Disposal Facility

Section 1 – All Events

Type of Event	Military Time		Duration (hours)	Event Code (see back of form)	SOP* Followed?	
	Date/Time Start	Date/Time End			Yes	No**
<input type="checkbox"/> Startup	_____	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Shutdown	_____	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Malfunction	_____	_____	_____	_____	Complete Section 2 Below	
<input type="checkbox"/> Non-malfunction	_____	_____	_____	_____		
Date Form Filled Out: _____			Signature: _____			

*Standard Operating Procedure (SOP) for Flare Startups (Manual & Automatic) and Shutdowns are provided in SSM Plan

If SOP in SSM Plan was not followed, **notify site engineer immediately.

Section 2 – Malfunction Events Only

Step	Corrective Action Procedures for All Malfunctions	Check one of the following for each step:	
		Procedure completed	Procedure Not Applicable
1.	Determine if the malfunction causing an unsafe operating condition (air entering landfill or piping, smoking, vibration, or other problem), which may harm people, the environment or the landfill gas control equipment. <i>If conditions are unsafe, notify your supervisor and follow steps under No. 3.</i>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Determine if landfill gas being released to the air (can you smell landfill gas, or measure/detect uncombusted gas flow?). <i>If landfill gas is being released, follow steps under No. 3.</i>	<input type="checkbox"/>	<input type="checkbox"/>
3.	If unsafe operating condition exists, or landfill gas is being released to the air, stop (if possible) landfill gas flow by one or more of the following: a. Close nearest valve to source of emissions b. Place a temporary cap on piping c. Apply other device (i.e., duct tape) d. Shut down blower e. Turn off main power disconnect switch to blower f. Other (Describe): _____	<input type="checkbox"/>	<input type="checkbox"/>
4.	Determine if other personnel/resource (qualified technician, electrician, consultant or other) are needed for malfunction diagnosis. <i>If other personnel or resources are not needed, go to No. 6.</i>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Contact qualified resource: a. Record contact name, date and time: _____ b. Contact site representative with information recorded in No. 5.a.	<input type="checkbox"/>	<input type="checkbox"/>
6.	Start malfunction diagnosis.	<input type="checkbox"/>	<input type="checkbox"/>
7.	Determine if other resources are needed to fix the malfunction (qualified technician, electrician, contractor, on-site resources, manufacturer's representative, or other). <i>If other resources are not needed, go to No. 9.</i>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Contact qualified resource: a. Record contact name, date and time: _____	<input type="checkbox"/>	<input type="checkbox"/>
9.	Fix the malfunction.	<input type="checkbox"/>	<input type="checkbox"/>
10.	Once the malfunction is fixed, restart the system per SOP if it had been shut down, and record startup times and dates on this form.	<input type="checkbox"/>	<input type="checkbox"/>
11.	Record date that malfunction occurred, date that malfunction was repaired, and total time that system was out of service in boxes in Section 1 of this form.	<input type="checkbox"/>	<input type="checkbox"/>
12.	Sign this form, copy it, and place it in the Startup Shutdown, Malfunction file.	<input type="checkbox"/>	<input type="checkbox"/>
13.	If the procedures listed above were not followed, contact the site engineer immediately.	<input type="checkbox"/>	<input type="checkbox"/>

EVENT CODES

For Startups and Shutdowns:

Startup: The setting in operation of an affected source or portion of an affected source for any purpose.

Shutdown: The cessation of operation of an affected source or portion of any source for any purpose.

Code	Event
1	Maintenance
2	Suspected collection system malfunction
3	Suspected control device malfunction
4	Suspected continuous monitoring system malfunction (temperature/flow/other)
5	Training
6	Gas system construction/expansion
99	Other (describe)

For Malfunctions:

Malfunction: Any sudden, infrequent and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

10	Automatic shutdown of control device by designed protective systems
11	Auto dialer callout
12	Shutdown alarms that result in the device not shutting down
13	Unalarmed shutdown
14	Control device smoking
15	Inspection identified malfunction
16	Loss of power – utility down
17	Loss of power – unknown
18	Damaged well, header or lateral piping
19	Leaks at wellheads, valves, flanges, test ports, seals, couplings, etc.
20	Condensate knock-out problems
21	Collection piping blockages
22	Problems due to settlement
23	Loss of phase
24	Blower overload condition
25	Blower bearing failure
26	Broken belts (if belt-drive) or broken coupling (if direct-drive) in blower
27	Continuous monitoring system malfunction – thermocouple
28	Continuous monitoring system malfunction – UV scanner
29	Continuous monitoring system malfunction – flow recorder
30	Continuous monitoring system malfunction – flow recorder
31	Continuous monitoring system malfunction – temperature recorder
32	Act of God (i.e., lightning, wind, etc.)
99	Other (describe)

SSM PLAN DEPARTURE REPORT FORM

Site Name: Cottonwood Hills Recycling and Disposal Facility

1. Type of Event: _____			
<input type="checkbox"/> Startup		<input type="checkbox"/> Shutdown	
<input type="checkbox"/> Malfunction			
2. Date: _____ Time: _____ Duration: _____			
3. Provide detailed explanation of the circumstances of the startup, shutdown, or malfunction:*			
4. Provide description of corrective actions taken:*			
5. Describe the reasons the SSM Plan was not followed:*			
6. Describe any proposed revisions to the SSM Plan:*			
7. Name (print): _____			
8. Title: _____			

*Use additional sheets if necessary.

Note: If the event documented in this form was a malfunction, and if the SSM Plan needs to be revised to address the particular type of malfunction that occurred, the revision of the SSM Plan must be made within 45 days of the event.

This form is intended to assist in meeting the record keeping and reporting requirements of 40 CFR 63.6(e)(3)(iv).

APPENDIX C

Site Specific Information